

AUTHOR INDEX

- ADAMS, E. M.—People—The Other Side of the Air Pollution Problem 311
- ADAMS, C. M. JR., D. V. RAGONE, J. R. SPRINKLE, and H. F. TAYLOR—Gas Porosity in Oxygen-Free Copper Castings 611
- ADAMS, C. M. JR., M. C. FLEMINGS, E. E. HUCKE, and H. F. TAYLOR—Metal Solidification in a Flowing Stream.... 636
- ADAMS, C. M. JR., D. V. RAGONE, and H. F. TAYLOR—Some Factors Affecting Fluidity of Metals 640
- ADAMS, C. M. JR., D. V. RAGONE, and H. F. TAYLOR—A New Method for Determining the Effect of Solidification Range on Fluidity 653
- ADAMS, C. M. JR., W. D. WALTHER, and H. F. TAYLOR—Mechanism for Pore Formation in Solidifying Metals.. 658
- AFS COMMITTEE (6-E)—Comparison of Liquid and Air-Quenched Pearlitic Malleable Irons: Part I—Duplex Iron 91
- AFS COMMITTEE (8-C)—Survey Report on the CO₂ Process 98
- AFS COMMITTEE (8-C-f)—Stickiness in Core Sand Mixtures 344
- AFS COMMITTEE (8-F)—Use of Glass Spheres for Calibrating Sand Testing Sieves 443
- AFS COMMITTEE (8-H)—Influence of Sand Distribution and Surface Coatings on Metal Penetration..... 82
- AHEARN, P. J., F. QUIGLEY, J. I. BLUHM and J. F. WALLACE—Some Considerations on the Tensile and Transverse Strength of Shell Mold and Core Sands 125
- AHLES, R. D., C. H. WEIGHT, and R. S. ZENO—Effect of Titanium Deoxidation on the Mechanical Properties and Microstructure of Cast Cr-Mo-V Steel..... 591
- AHLES, R. D., R. S. ZENO, and W. R. NESTLE—Effect of Aluminum Deoxidation on the Mechanical Properties and Microstructure of Cast Cr-Mo-V Steel..... 600
- ALEXANDER, A. P., and E. BOYWID—Experiences with Basic Cupola Refractories and Melting 493
- AMALA, R. S., J. H. SMITH, A. L. BOEGEHOLD, and R. F. THOMPSON—The General Motors Blow-Hot Press Automatic Shell Molding Machine 422
- ATTERTON, D. V.—The Carbon-Dioxide Process 14
- BARLOW, T. E.—Developments of High Pressure Molding With CO₂ Process Sands 336
- BARRABEE, J. M.—Engineering, Cost, and Quality..... 459
- BELTER, E. H., A. H. ZRIMSEK, and R. W. HEINE—Effects of Charge Proportions, Furnace Atmosphere, Flow Rate, and Melt-Down Time on Properties of Malleable Iron 72
- BLUHM, J. I., P. J. AHEARN, F. QUIGLEY, and J. F. WALLACE—Some Considerations on the Tensile and Transverse Strength Testing of Shell Mold and Core Sands..... 125
- BOEGEHOLD, A. L., R. S. AMALA, J. H. SMITH, and R. F. THOMPSON—The General Motors Blow-Hot Press Automatic Shell Molding Machine 422
- BOLT, J. E.—Cold Process For Resin-Coated Foundry Sands 247
- BOTSFORD, J. H.—Noise Reduction in the Manufacture of Marine Propellers Through The Use of Vibration Damping 588
- BOYWID, E. and A. P. ALEXANDER—Experience with Basic Cupola Refractories and Melting 493
- BRYCE, J. T., F. B. ROTE, and E. F. CHOJNOWSKI—Malleable Base Spheroidal Iron 197
- BUCHMAN, E. L.—Casting Tolerances As Affected by Automation in the Machine Shop 264
- CHOJNOWSKI, E. F., F. B. ROTE, and J. T. BRYCE—Malleable Base Spheroidal Iron 197
- CHRISTOPHER, C. F.—Hot Tearing Characteristics of Acid and Basic Steel Castings Determined by High Temperature Testing 293
- CLARK, A. M.—Principles of Core Blowing..... 577
- COLWELL, D. L. and O. TICHY—Machinability of Aluminum Die Castings 236
- DAVIS, J. A., H. W. DEEM, and H. W. LOWNIE, JR.—Service Life of Iron Castings Can Be Affected by Their Thermal Conductivity 223
- DEEM, H. W., J. A. DAVIS, and H. W. LOWNIE, JR.—Service Life of Iron Castings Can Be Affected by Their Thermal Conductivity 223
- DUFLOT, J.—Cracking and Life of Ingot Molds..... 387
- EDELMAN, R., N. HEHNER, and H. MCCURDY—Age-Hardening Characteristics of a Cast Alloy of Copper-5.8% Titanium 313
- EDENS, W. W.—Management of a Metallurgical Laboratory 719
- EKEY, D. C. and E. G. VOGEL—Ceramic-Mold Process for Steel Castings 439
- EKEY, D. C. and R. L. YARD—Analysis of Factors Affecting Surface Finish of Gray Iron Castings 671
- EKEY, D. C. and J. M. LEAMAN—Statistical Techniques for Classifying Foundry Sands 679
- EMMETT, W. D.—Bentonite—Properties and Composition (Their Relation to Casting Defects) 482
- ERHART, E. E., JR. and H. WAGERS—Incentives In A Small Jobbing Foundry 133
- FERRY, M. and MARGERIE, J. C.—Causes and Effects of Grain Size in Pearlitic Gray Cast Iron 41
- FLEMINGS, M. C., C. M. ADAMS, JR., E. E. HUCKE, and H. F. TAYLOR—Metal Solidification in a Flowing Stream.... 636
- FLINN, R. A.—Quantitative Evaluation of the Susceptibility of Various Alloys to Shrinkage Defects..... 665
- FLINN, R. A. and P. K. TROJAN—Pressure Tightness in 85-5-5-5 Bronze Castings 339
- FRAZIER, F.—Compensation Trends in Loss of Hearing... 357
- GERTSMAN, S. L. and R. C. SHNAY—Rising of Nodular Irons: Part III—The Effect of Pouring Temperature on Shrink Depth 271
- GOLDSPIEL, S., N. A. KAHN, and R. R. WALTEN—Application of Radiography in the Manufacture of Bronze Castings 149
- GOTHERIDGE, J. E. and H. G. NEU—Fluxing and Deoxidation Treatments for Copper 616
- GRUBE, K. R., R. M. LANGE, and J. G. KRA—Modifications in Vertical-Gating Principles 54
- HANEY, E. G. and M. F. HAWKES—The Nucleation of Graphite During Decomposition of Cementite..... 515
- HANNON, J. W. G.—Aluminum Therapy in Silicosis..... 509
- HANSON, W. O. and E. R. LUND—You Can Reduce Noise in Your Foundry 329
- HARRIS, R. C. and K. L. HERRICK—A Tensile Bar Shell Mold for Light Alloys 463
- HARRIS, R. C., S. LIPSON, and H. ROSENTHAL—Tensile Properties of Aluminum-Silicon-Magnesium Alloys and the Effects of Sodium Modification..... 470
- HAWKES, M. F. and E. G. HANEY—The Nucleation of Graphite During Decomposition of Cementite..... 515
- HEHNER, N., H. MCCURDY, and R. EDELMAN—Age-Hardening Characteristics of a Cast Alloy of Copper-5.8% Titanium 313
- HEINE, R. W., A. H. ZRIMSEK, and E. H. BELTER—Effects of Charge Proportions, Furnace Atmosphere Flow Rate, and Melt-Down Time on Properties of Malleable Iron 72
- HEINE, R. W.—Molding Sands, Molding Methods and Casting Dimensions 398
- HEINE, R. W., E. H. KING, and J. S. SCHUMACHER—Does Sand Testing Give Us The Facts?..... 408
- HEINRICH, W. L.—Hot-Blast Cupola Practice..... 532
- HERRICK, K. L. and R. C. HARRIS—A Tensile Bar Shell Mold for Light Alloys 463

AUTHOR INDEX

- ADAMS, E. M.—People—The Other Side of the Air Pollution Problem 311
- ADAMS, C. M. JR., D. V. RAGONE, J. R. SPRINKLE, and H. F. TAYLOR—Gas Porosity in Oxygen-Free Copper Castings 611
- ADAMS, C. M. JR., M. C. FLEMINGS, E. E. HUCKE, and H. F. TAYLOR—Metal Solidification in a Flowing Stream.... 636
- ADAMS, C. M. JR., D. V. RAGONE, and H. F. TAYLOR—Some Factors Affecting Fluidity of Metals 640
- ADAMS, C. M. JR., D. V. RAGONE, and H. F. TAYLOR—A New Method for Determining the Effect of Solidification Range on Fluidity 653
- ADAMS, C. M. JR., W. D. WALTHER, and H. F. TAYLOR—Mechanism for Pore Formation in Solidifying Metals.. 658
- AFS COMMITTEE (6-E)—Comparison of Liquid and Air-Quenched Pearlitic Malleable Irons: Part I—Duplex Iron 91
- AFS COMMITTEE (8-C)—Survey Report on the CO₂ Process 98
- AFS COMMITTEE (8-C-f)—Stickiness in Core Sand Mixtures 344
- AFS COMMITTEE (8-F)—Use of Glass Spheres for Calibrating Sand Testing Sieves 443
- AFS COMMITTEE (8-H)—Influence of Sand Distribution and Surface Coatings on Metal Penetration..... 82
- AHEARN, P. J., F. QUIGLEY, J. I. BLUHM and J. F. WALLACE—Some Considerations on the Tensile and Transverse Strength of Shell Mold and Core Sands 125
- AHLES, R. D., C. H. WEIGHT, and R. S. ZENO—Effect of Titanium Deoxidation on the Mechanical Properties and Microstructure of Cast Cr-Mo-V Steel..... 591
- AHLES, R. D., R. S. ZENO, and W. R. NESTLE—Effect of Aluminum Deoxidation on the Mechanical Properties and Microstructure of Cast Cr-Mo-V Steel..... 600
- ALEXANDER, A. P., and E. BOYWID—Experiences with Basic Cupola Refractories and Melting 493
- AMALA, R. S., J. H. SMITH, A. L. BOEGEHOLD, and R. F. THOMPSON—The General Motors Blow-Hot Press Automatic Shell Molding Machine 422
- ATTERTON, D. V.—The Carbon-Dioxide Process 14
- BARLOW, T. E.—Developments of High Pressure Molding With CO₂ Process Sands 336
- BARRABEE, J. M.—Engineering, Cost, and Quality..... 459
- BELTER, E. H., A. H. ZRIMSEK, and R. W. HEINE—Effects of Charge Proportions, Furnace Atmosphere, Flow Rate, and Melt-Down Time on Properties of Malleable Iron 72
- BLUHM, J. I., P. J. AHEARN, F. QUIGLEY, and J. F. WALLACE—Some Considerations on the Tensile and Transverse Strength Testing of Shell Mold and Core Sands..... 125
- BOEGEHOLD, A. L., R. S. AMALA, J. H. SMITH, and R. F. THOMPSON—The General Motors Blow-Hot Press Automatic Shell Molding Machine 422
- BOLT, J. E.—Cold Process For Resin-Coated Foundry Sands 247
- BOTSFORD, J. H.—Noise Reduction in the Manufacture of Marine Propellers Through The Use of Vibration Damping 588
- BOYWID, E. and A. P. ALEXANDER—Experience with Basic Cupola Refractories and Melting 493
- BRYCE, J. T., F. B. ROTE, and E. F. CHOJNOWSKI—Malleable Base Spheroidal Iron 197
- BUCHMAN, E. L.—Casting Tolerances As Affected by Automation in the Machine Shop 264
- CHOJNOWSKI, E. F., F. B. ROTE, and J. T. BRYCE—Malleable Base Spheroidal Iron 197
- CHRISTOPHER, C. F.—Hot Tearing Characteristics of Acid and Basic Steel Castings Determined by High Temperature Testing 293
- CLARK, A. M.—Principles of Core Blowing..... 577
- COLWELL, D. L. and O. TICHY—Machinability of Aluminum Die Castings 236
- DAVIS, J. A., H. W. DEEM, and H. W. LOWNIE, JR.—Service Life of Iron Castings Can Be Affected by Their Thermal Conductivity 223
- DEEM, H. W., J. A. DAVIS, and H. W. LOWNIE, JR.—Service Life of Iron Castings Can Be Affected by Their Thermal Conductivity 223
- DUFLOT, J.—Cracking and Life of Ingot Molds..... 387
- EDELMAN, R., N. HEHNER, and H. MCCURDY—Age-Hardening Characteristics of a Cast Alloy of Copper-5.8% Titanium 313
- EDENS, W. W.—Management of a Metallurgical Laboratory 719
- EKEY, D. C. and E. G. VOGEL—Ceramic-Mold Process for Steel Castings 439
- EKEY, D. C. and R. L. YARD—Analysis of Factors Affecting Surface Finish of Gray Iron Castings 671
- EKEY, D. C. and J. M. LEAMAN—Statistical Techniques for Classifying Foundry Sands 679
- EMMETT, W. D.—Bentonite—Properties and Composition (Their Relation to Casting Defects) 482
- ERHART, E. E., JR. and H. WAGERS—Incentives In A Small Jobbing Foundry 133
- FERRY, M. and MARGERIE, J. C.—Causes and Effects of Grain Size in Pearlitic Gray Cast Iron 41
- FLEMINGS, M. C., C. M. ADAMS, JR., E. E. HUCKE, and H. F. TAYLOR—Metal Solidification in a Flowing Stream.... 636
- FLINN, R. A.—Quantitative Evaluation of the Susceptibility of Various Alloys to Shrinkage Defects..... 665
- FLINN, R. A. and P. K. TROJAN—Pressure Tightness in 85-5-5-5 Bronze Castings 339
- FRAZIER, F.—Compensation Trends in Loss of Hearing... 357
- GERTSMAN, S. L. and R. C. SHNAY—Rising of Nodular Irons: Part III—The Effect of Pouring Temperature on Shrink Depth 271
- GOLDSPIEL, S., N. A. KAHN, and R. R. WALTEN—Application of Radiography in the Manufacture of Bronze Castings 149
- GOTHERIDGE, J. E. and H. G. NEU—Fluxing and Deoxidation Treatments for Copper 616
- GRUBE, K. R., R. M. LANGE, and J. G. KRA—Modifications in Vertical-Gating Principles 54
- HANEY, E. G. and M. F. HAWKES—The Nucleation of Graphite During Decomposition of Cementite..... 515
- HANNON, J. W. G.—Aluminum Therapy in Silicosis..... 509
- HANSON, W. O. and E. R. LUND—You Can Reduce Noise in Your Foundry 329
- HARRIS, R. C. and K. L. HERRICK—A Tensile Bar Shell Mold for Light Alloys 463
- HARRIS, R. C., S. LIPSON, and H. ROSENTHAL—Tensile Properties of Aluminum-Silicon-Magnesium Alloys and the Effects of Sodium Modification..... 470
- HAWKES, M. F. and E. G. HANEY—The Nucleation of Graphite During Decomposition of Cementite..... 515
- HEHNER, N., H. MCCURDY, and R. EDELMAN—Age-Hardening Characteristics of a Cast Alloy of Copper-5.8% Titanium 313
- HEINE, R. W., A. H. ZRIMSEK, and E. H. BELTER—Effects of Charge Proportions, Furnace Atmosphere Flow Rate, and Melt-Down Time on Properties of Malleable Iron 72
- HEINE, R. W.—Molding Sands, Molding Methods and Casting Dimensions 398
- HEINE, R. W., E. H. KING, and J. S. SCHUMACHER—Does Sand Testing Give Us The Facts?..... 408
- HEINRICH, W. L.—Hot-Blast Cupola Practice..... 532
- HERRICK, K. L. and R. C. HARRIS—A Tensile Bar Shell Mold for Light Alloys 463

- HOLDEMAN, G. E. — Metallography in the Magnesium Foundry 698
- HUCKE, E. E., M. C. FLEMINGS, C. M. ADAMS, JR., and H. F. TAYLOR — Metal Solidification in a Flowing Stream.... 636
- HUNSICKER, H. Y. and R. C. LEMON — New Aluminum Permanent Mold Casting Alloys C355 and A356..... 255
- JACOBI, E. N. — Novel Aluminum Engine Die Castings.... 489
- JENKINS, L. R. and C. C. LAWSON — Properties of Refractories Affect Air Furnace Bottom Service..... 432
- JUNKER, OTTO, — Recent Development of the Coreless Line Frequency Induction Melting Furnace in European Foundries 543
- KAHN, N. A., S. GOLDSPIEL, and R. R. WALTEN — Application of Radiography in the Manufacture of Bronze Castings 149
- KANE, J. M. — Equipment for Cupola-Emission Control.... 525
- KING, E. H., R. W. HEINE, and J. S. SCHUMACHER — Jolt Test For Sand 415
- KRAUSE, E. D. and E. A. LANGE — Evaluation of Coke Quality by a Compressive Test..... 209
- KRISHON, J. P. — Centrifugal Casting of Unusual Shapes in Non-Ferrous Alloys 435
- KURA, J. G., K. R. GRUBE, and R. M. LANG — Modifications in Vertical-Gating Principles 54
- LANG, R. M., K. R. GRUBE, and J. G. KURA — Modifications in Vertical-Gating Principles 54
- LANGE, E. A. and E. D. KRAUSE — Evaluation of Coke Quality by a Compressive Test 209
- LAWSON, E. E. and L. R. JENKINS — Properties of Refractories Affect Air Furnace Bottom Service..... 432
- LEAMAN, J. M. and D. C. EKEY — Statistical Techniques for Classifying Foundry Sands 679
- LEMON, R. C. and W. E. SICHA — New Aluminum Casting Alloy XA140 for Elevated Temperature Applications.. 261
- LEMON, R. C. and H. Y. HUNSICKER — New Aluminum Permanent Mold Casting Alloys C355 and A356..... 255
- LEWIS, A. H. and G. J. VINGAS — Anionic or Cationic Agents — A Solution to Sand Problems 453
- LIPSON, S., R. C. HARRIS, and H. ROSENTHAL — Tensile Properties of Aluminum-Silicon-Magnesium Alloys and the Effects of Sodium Modification 470
- LOEBRECKE, E. — Development of Hot-Blast Cupola Melting Technique in Europe 171
- LOWNIE, JR., H. W. — Use of Pig Iron in Iron Foundries (With Particular Attention to Specifications, Prices, Secondary Elements, and 'Heredity') 104
- LOWNIE, JR., H. W. and JOHN VARGA, JR. — Influence of Temperature on Mechanical Strength of Coke..... 217
- LOWNIE, JR., H. W., J. A. DAVIS, and H. W. DEEM — Service Life of Iron Castings Can Be Affected by Their Thermal Conductivity 223
- LUND, E. R. and W. O. HANSON — You Can Reduce Noise in Your Foundry 329
- MARGERIE, JEAN-CLAUDE and MICHAEL FERRY — Causes and Effects of Grain Size in Pearlitic Gray Cast Iron..... 41
- MARTIN, ROSS, JR., Practical Foundry Application of Statistical Quality Control 232
- MASSARI, S. C. — Marketing Your Product 1
- MCAFFEE, E. J. — Use of Epoxy Resin as Pattern Material.. 504
- MCCURDY, H., N. HEHNER, and R. EDELMAN — Age-Hardening Characteristics of a Cast Alloy of Copper-5.8% Titanium 313
- MEADER, R. F. — Green-Sand Casting Finish 284
- MILLS, D. S. — Stickiness in Core Sand Mixtures..... 344
- MONDOLFO, L. F. — Metallography of Aluminum Alloys.... 693
- MONTGOMERY, A. M. — Metallography for the Foundryman — Good Metallographic Practice 688
- MOREY, R. E. and J. H. SCHAUM — Use of Glass Spheres for Calibrating Sand Testing Sieves 443
- NAVARRO, JOSE and H. F. TAYLOR — Inorganic Binders Solve Shell Molding Problems 625
- NELSON, K. E. and W. P. SAUNDERS — An Evaluation of ZH62XA Magnesium Sand Casting Alloy..... 364
- NESTLE, W. R., R. S. ZENO, and R. D. AHLES — Effect of Aluminum Deoxidation on the Mechanical Properties and Microstructure of Cast Cr-Mo-V Steel 600
- NEU, H. G. and J. E. GOTHBRIDGE — Fluxing and Deoxidation Treatments for Copper 616
- NEWBERRY, FRANK — Pad Washing With Carbon Arc Process 430
- NIELSEN, E. H. — Melting Malleable Iron with Pulverized Coal and Oil as Fuel 242
- PASCHKIS, V. — Transient Heat Flow 100
- PASCHKIS, V. — Temperature Drop in Pouring Ladles..... 565
- PEARSON, W. E. — Effects of Section Size Variations in a Test Casting on Properties of Some Mg-Al-Zn Alloys.. 376
- PECK, J. B. and A. H. RAUCH — Heat Treatment of Gray-Cast Iron 227
- PUTZ, H. and E. C. ZUPPANN — Evaluating Green Properties of Cereal Core Binders 267
- QUIGLEY, F., P. J. AHEARN, J. I. BLUHN, and J. F. WALLACE — Some Considerations on the Tensile and Transverse Strength Testing of Shell Mold and Core Sands..... 125
- RAGONE, D. V., C. M. ADAMS, JR., and H. F. TAYLOR — Some Factors Affecting Fluidity of Metals..... 640
- RAGONE, D. V., C. M. ADAMS, JR., and H. F. TAYLOR — A New Method for Determining the Effect of Solidification Range on Fluidity 653
- RAUCH, A. J. and J. B. PECK — Heat Treatment of Gray-Cast Iron 227
- RIGHTER, R. V. — Annealing on Five-Day Week Basis..... 290
- ROBINSON, K. E. — Control of Make-Up Air in Industrial Plants 447
- ROSENTHAL, H., R. C. HARRIS, and S. LIPSON — Tensile Properties of Aluminum-Silicon-Magnesium Alloys and the Effects of Sodium Modification 470
- ROSENTHAL, P. C. — Ferrous Metallographic Practice..... 709
- ROTE, F. B., E. F. CHOJNOWSKI, and J. T. BRYCE — Malleable Base Spheroidal Iron 197
- SANDERS, C. A. — Casting Finish-Tolerance-Precision 318
- SAUNDERS, W. P. and K. E. NELSON — An Evaluation of ZH62XA Magnesium Sand Casting Alloy 364
- SCAGGS, F. M. — Core Making With CO₂ Process 333
- SCHAUM, J. H. and R. E. MOREY — Use of Glass Spheres for Calibrating Sand Testing Sieves 443
- SCHUMACHER, J. S., R. W. HEINE, and E. H. KING — Does Sand Testing Give Us The Facts? 408
- SHINAY, R. C. and S. L. GERTSMAN — Riser of Nodular Irons: Part III — The Effect of Pouring Temperature on Shrink Depth 271
- SICHA, W. E. and R. C. LEMON — New Aluminum Casting Alloy XA140 for Elevated Temperature Applications.. 261
- SINNETT, A. C. — Basic Cost Concepts for the Small-Medium Foundry 167
- SMITH, J. H., R. S. AMALA, A. L. BOEGEHOED, and R. F. THOMSON — The General Motors Blow-Hot Press Automatic Shell Molding Machine 422
- SPRINKLE, J. K., C. M. ADAMS, JR., and H. F. TAYLOR — Gas Porosity in Oxygen-Free Copper Castings..... 611
- STEIN, E. M. — Stress-Strain Relationship for Gray Iron... 214
- STOCH, C. M. — Some Aspects of Dust Suppression in Foundries 136
- TAYLOR, H. F., J. K. SPRINKLE, C. M. ADAMS, JR. and D. V. RAGONE — Gas Porosity in Oxygen-Free Copper Castings 611
- TAYLOR, H. F. and JOSE NAVARRO — Inorganic Binders Solve Shell Molding Problems 625

TAYLOR, H. F., M. C. FLEMINGS, C. M. ADAMS, JR., and E. E. HUCKE—Metal Solidification in a Flowing Stream...	636	WALTEN, R. R., N. A. KAHN, and S. GOLDSPIEL—Application of Radiography in the Manufacture of Bronze Castings	149
TAYLOR, H. F., D. V. RAGONE, and C. M. ADAMS, JR.—Some Factors Affecting Fluidity of Metals	640	WALTHER, D. W., C. M. ADAMS JR., and H. F. TAYLOR—Mechanism for Pore Formation in Solidifying Metals	658
TAYLOR, H. F., D. V. RAGONE, and C. M. ADAMS, JR.—A New Method for Determining the Effect of Solidification Range on Fluidity	653	WEIGHT, C. H., R. D. AHLES, and R. S. ZENO—Effect of Titanium Deoxidation on the Mechanical Properties and Microstructure of Cast Cr-Mo-V Steel.....	591
TAYLOR, H. F., W. D. WALTHER, and C. M. ADAMS, JR.—Mechanism for Pore Formation in Solidifying Metals...	658	WILLIAMS, D. C.—Some Observations on the Transverse Test at Elevated Temperatures for Molded Sand Mixtures	353
TAYLOR, JOHN—The Human Factor in New Equipment...	147	WYMAN, C. H.—Gas Flushing of Molten Steel.....	62
THOMSON, R. F., R. S. AMALA, J. H. SMITH, and A. L. BOEGEHOLD—The General Motors Blow-Hot Press Automatic Shell Molding Machine	422		
TICHY, O. and D. L. COLWELL—Machinability of Aluminum Die Castings	236	YARD, R. L. and D. C. EKEY—Analysis of Factors Affecting Surface Finish of Gray Iron Castings.....	671
TONKS, W. G.—Sub-surface Blowholes in Gray Irons and Their Association with Manganese Sulphide Segregation	551	YOUNG, M. K.—New Developments for the Patternmaking Industry	668
TROJAN, R. K. and R. A. FLINN—Pressure Tightness in 85-5-5-5 Bronze Castings	339		
VARGA, JOHN, JR. and H. W. LOWNIE, JR.—Influence of Temperature on Mechanical Strength of Coke.....	217	ZENO, R. S., R. D. AHLES, and C. H. WEIGHT—Effect of Titanium Deoxidation on the Mechanical Properties and Microstructure of Cast Cr-Mo-V Steel.....	591
VINGAS, G. J. and A. H. LEWIS—Anionic or Cationic Agents—A Solution to Sand Problems.....	453	ZENO, R. S., R. D. AHLES, and W. R. NESTLE—Effect of Aluminum Deoxidation on the Mechanical Properties and Microstructure of Cast Cr-Mo-V Steel	600
VOGEL E. G. and D. C. EKEY—Ceramic-Mold Process for Steel Castings	439	ZRIMSEK, A. H., E. H. BELTER and R. W. HEINE—Effects of Charge Proportions, Furnace Atmosphere Flow Rate, and Melt-Down Time on Properties of Malleable Iron	72
WAGERS, H. and E. E. ERHART, JR.—Incentives in a Small Jobbing Foundry	133	ZUPPANN, E. C. and H. PUTZ—Evaluating Green Properties of Cereal Core Binders	267
WALLACE, J. F., P. J. AHEARN, F. QUIGLEY, and J. I. BLUHM—Some Considerations on the Tensile and Transverse Strength Testing of Shell Mold and Core Sands.....	125		

SUBJECT INDEX

A

AFS grain fineness number.....	679
AFS Research and Committee Reports.....	54, 62, 72, 82, 91, 98, 100, 344, 339, 443
Acid steel castings.	
Hot tearing characteristics of.....	293
Accounting, Cost	167
Advertising your product.....	11
Age-hardening characteristics of a cast alloy of copper- 5.8 per cent titanium.....	313
Air	
furnace bottom service, effect of refractories on.....	432
pollution	311
pollution control	525
quenched pearlitic malleable irons.....	91
supply in industrial plants.....	447
Aircraft engines, Aluminum alloy for.....	263
Alloy,	
aluminum	261, 693
magnesium	364
Alloys,	
Aluminum	255
Aluminum-Silicon-Magnesium, Tensile properties of	470
aluminum, Metallography of.....	693
magnesium-aluminum-zinc, Test castings of.....	376
Aluminum	
alloys, Metallography of.....	693, 701
casting alloy	261
castings, CO ₂ process in making.....	98
content of molten steel.....	70
deoxidation, effect on mechanical properties and microstructure of cast Cr-Mo-V steel.....	600
as deoxidizer in steel casting.....	710
die castings, Machinability of.....	236
engine die castings.....	489
in gray iron castings.....	115
magnesium alloy casting.....	56
in malleable iron.....	121
melting	545
in nodular iron.....	118
permanent mold casting alloys C355 and A356.....	255
shell molding	463
silicon-magnesium alloys, Tensile properties of.....	470
therapy in silicosis.....	509
zinc alloys, magnesium, Metallography of.....	701
zinc, magnesium-alloys, test casting.....	376
American Iron and Steel Institute	
pig iron classifications.....	106
American Society for Testing Materials	
pig iron classifications.....	106
An evaluation of 2H62XA magnesium sand casting alloy	364
Analysis of factors affecting surface finish of gray iron castings	671
Anionic or cationic agent—a solution to sand problems..	453
Annealability of malleable iron.....	78
Annealing,	
effect on malleable iron.....	713
effect on structure of alloy steels.....	711
Antimony	
in gray iron castings.....	115
in nodular iron	118
Application of radiography in the manufacture of bronze castings	149
Arsenic	
in gray iron castings.....	115
in malleable iron	121
in nodular iron	119
Automatic-controlled hot-blast cupola.....	179
Automatic shell molding.....	422
Automation	
in the machine shop.....	264

B

Basic	
cost concepts for the small-medium foundry.....	167
cupola refractories	493
slag cupola practice	532
steel castings, Hot tearing characteristics.....	293
Bells,	
Church, Cores for	577
Bentone, defined	614
Bentonite, properties and composition.....	482
sand mixtures	353
Bessemer pig iron	109
Bibliography,	
copper-titanium alloys.....	316
cupola	193
dust suppression	146
fluidity	636
fluidity of metals	649
gray iron castings.....	676
metallography	718
nodular iron, Riserling of.....	281
pearlitic malleable iron.....	97
sand testing	687
Binders, inorganic, for shell molding.....	625
Bismuth	
in gray iron castings.....	115
in malleable iron	121
Blast furnaces	104
Blow-hot press shell molding machine.....	422
Blowholes in gray irons.....	551
Blowing of cores.....	577
Boron	
in gray iron castings.....	115
influence on tensile properties of malleable base spheroidal iron	207
in malleable iron	121
Brass and bronze castings, made by CO ₂ process.....	98
Brick, Refractory, for air furnace bottom service.....	432
Bronze,	
casting, Ancient	577
castings, Application of radiography in manufacture	149
castings, Pressure tightness in.....	339

C

Cadmium	
in gray iron castings.....	115
in nodular iron	119
Calcium	
boride additions to copper.....	619
in nodular iron.....	119
Calibrating sand testing sieves.....	443
Carbon	
arc process	430
content of pig iron.....	108
dioxide process	14, 333
dioxide process sand for high pressure molding.....	356
dioxide process survey.....	98
in malleable iron.....	119
pickup in cupolas.....	538
solubility in copper	611
Carbonates,	
effect on surface quality of steel castings.....	630
Cast iron,	
coreless line frequency	
induction furnace melting.....	546
Metallography of	709
stove, Oldest known.....	577
Castability of magnesium alloy.....	364
Casting	
characteristics of aluminum alloy.....	263
dimensions	398

E

Elasticity of gray iron.....	214
Elevated temperature applications, Aluminum casting alloy for	261
Engine die castings, aluminum.....	489
Engineering, cost and quality.....	459
Epoxy resin as pattern material.....	504, 668
Equipment	
for cupola-emission control.....	525
new, Human factor in.....	147
Etching of samples for metallographic inspection.....	691
Europe, development of hot-blast cupola melting technique in	171
European foundries, coreless line frequency induction melting furnace in	543
Evaluating green properties of cereal core binders.....	267
Evaluation of coke quality by a compressive test.....	209
Evaporation of water from molds.....	453
Exhaust systems for grinders.....	140
Experiences with basic cupola refractories and melting..	493

F

Facting additives	286
Ferrous metallographic practice	709
Finish	
casting	318
Green-sand	284
Flowability of molding sand.....	288, 326
Fluidity	
of metals, Some factors affecting.....	640
new method for determining effect of solidification range on	653
Flushing of molten steel, Gas.....	62
Fluxing and deoxidation treatments for copper.....	616
Forgings vs. castings.....	3
Foundry	
cost concepts	167
metallography	688
pig iron	109
sands, Statistical techniques for classifying.....	679
Fuel for melting malleable iron.....	242
Furnace	
atmosphere flow rate, effect on malleable iron.....	72
bottom service, Effect of refractories on.....	432
Induction	543

G

Gas	
content of copper melts.....	617
flow rates, malleable iron	75
flushing of molten steel.....	62
porosity in oxygen-free copper castings.....	611
rate of evolution.....	632
Gating	
effect on shell molded castings.....	626
and rising of bronze castings.....	153
principles, vertical, Modifications in.....	54
General Motors blow-hot press automatic shell molding machine	422
Glass spheres for calibrating sand testing Sieves.....	443
Grain	
distribution of sand.....	284
size in pearlitic gray cast iron.....	41
structure of castings.....	636
Graphite	
flake distribution in cast iron.....	715
nucleation during decomposition of cementite.....	515
structure of malleable base spheroidal iron.....	197
Gray cast iron	
heat treatment	227
pearlitic, Grain size in.....	41
Gray Iron	
castings	7, 114
by CO ₂ process.....	98
Factors affecting surface finish of.....	671
charge costs	499
stress-strain relationship	214
Gray Irons, Blowholes in.....	551

Green

properties of cereal core binders, Evaluating.....	267
sand casting finish.....	284
sand molding	398
sand molds, Nodular iron poured in.....	274
sand vs. ceramic-mold process.....	442

Grinding

machines	139
of magnesium alloys.....	698
of samples for metallographic inspection.....	689

H

Hardening, Age of copper-titanium alloy.....	313
Hardness of gray iron.....	227
Health hazard, Dust as.....	136
Hearing loss, Compensation trends in.....	357
Heat	
flow	100
loss of metal in pouring ladles.....	565
transfer	100
treatment	
of copper-titanium alloy.....	314
of gray-cast iron.....	227
effect on steel.....	66
of malleable-base spheroidal iron.....	208
Heredity in pig iron.....	122
High	
pressure molding with CO ₂ process sands.....	336
temperature testing of steel castings.....	293
Hot	
blast cupola melting technique.....	171
blast cupola practice.....	532
tearing characteristics of acid and basic steel castings determined by high temperature testing.....	293
Hoyt, Charles Edgar, Memorial Lecture—Marketing your product	1
Human factor in new equipment.....	147
Hypereutectic cast iron.....	272
Hypoeutectic cast iron	272

I

Impact	
properties of steel castings.....	296
strength of steel.....	64
Incentives in a small jobbing foundry.....	133
Inclusion distribution in steel castings.....	63, 595, 604, 709
Induction melting furnace, Coreless line.....	543
Industrial management	147
Industrial plants, Air control in.....	447
Influence of,	
sand distribution and surface coatings on metal penetration	82
temperature on mechanical strength of coke.....	217
Ingot molds, Cracking of.....	387
Inorganic binders solve shell molding problems.....	625
Inspection of castings.....	266
Investment casting vs. ceramic-mold process.....	442
Iron	
in aluminum die castings.....	236
castings, Service life of.....	223
effect on ductility of aluminum alloys.....	257
foundries, Use of pig iron in.....	104
heat loss from pouring ladles.....	565
nucleation of graphite during cementite decomposition	517

J

Jobbing foundry, small, Incentives in.....	133
Jolt test for sand.....	415

L

Laboratory management	719
Ladles, pouring, Temperature drop in.....	565
Lanthanum in malleable iron.....	121
Lead	
in gray iron castings.....	115
in malleable iron.....	121
in nodular iron.....	118
tin alloys, Fluidity of.....	653

Leakage of bronze castings.....	339
Light alloys, Tensile bar shell mold for.....	463
Line frequency induction furnace, Coreless.....	543
Liquid-quenched pearlitic malleable irons.....	91
Lithium addition to copper.....	619
Loss of hearing, Compensation trends in.....	357
Low-carbon steel castings, Shell molding of.....	625
Lubrication of dies.....	237

M

Machinability	
of aluminum die castings.....	236
of gray iron.....	717
of malleable base spheroidal iron.....	203
Machine shop, automation in.....	264
Magnesium	
age-hardening characteristics on aluminum-silicon-magnesium alloys.....	474
alloy castings.....	2
alloys, aluminum-silicon, Tensile properties of.....	470
aluminum-alloy casting.....	56
aluminum alloys, Metallography of.....	701
in aluminum die castings.....	236
aluminum-zinc alloys, Metallography of.....	701
aluminum-zinc alloys, Test casting of.....	376
effect on tensile properties of aluminum alloys.....	256, 475
melting.....	546
metallography of.....	698
in nodular iron.....	118
sand casting alloy.....	364
thorium-zinc-zirconium alloy, Metallography of.....	706
Malleable	
base spheroidal iron.....	197
iron	
by CO ₂ process.....	98
castings.....	3
effects of charge proportions, furnace atmosphere flow rate, and melt-down time on properties of.....	72
Melting with pulverized coal and oil.....	242
Metallography of.....	709
Pearlitic.....	91
pig iron.....	109, 119
Management, Cost.....	167
Foundry.....	133, 147
of a Metallurgical Laboratory.....	719
Manganese	
Dioxide as binder for shell molding.....	625
in aluminum die castings.....	236
in malleable iron.....	120
in pig iron.....	112
sulphide segregation in gray irons.....	551
Marine propeller manufacture.....	588
Marketing your product.....	1
Mechanical properties of cast Cr-Mo-V steel, Effect of aluminum deoxidation on.....	600
Mechanism for pore formation in solidifying metals.....	658
Melting aluminum alloys.....	465
Metallographic study of steel.....	67, 709
Metals, Fluidity of.....	640
Mechanical strength of coke, Influence of temperature on.....	217
Mechanization of machine shop.....	264
Melt-down time, effect on malleable iron.....	72
Melting	
in the basic cupola.....	493
in hot-blast cupola.....	532
malleable iron.....	72
with pulverized coal and oil as fuel.....	242
practice, quality control.....	233
technique, Cupola.....	171
Metal	
penetration, Influence of sand distribution and surface coatings on.....	82
pressure, effect on casting finish.....	671
solidification in a flowing stream.....	636
Metals, solidification of, Pore formation in.....	658

Metallographic	
examination, preparation of metals for.....	698
examination of steel castings.....	592, 709
laboratory, Procedure in.....	720
practice, Ferrous.....	688, 709
study of steel.....	300
Metallography	
of aluminum alloys.....	693
for the foundryman.....	688
in the magnesium foundry.....	698
Metallurgical	
laboratory, Management of.....	719
reactions in the hot-blast cupola.....	532
Mexican graphite—base core wash.....	82
Modifications in vertical-gating principles.....	54
Modulus of elasticity of malleable base spheroidal iron.....	203
Modulus of rupture of molded sand mixtures.....	354
Moisture in sand molding.....	325
Mold	
designs for light alloys.....	463
hardness testing.....	408
hardness vs. finish.....	285
surfaces.....	82
Molded sand mixtures, Transverse test for.....	353
Molding	
high pressure, with CO ₂ process sand.....	336
machines.....	400, 415
shell.....	422
methods.....	398
sand, for CO ₂ Process.....	99
tests.....	415
sands, molding methods and casting dimensions.....	398
Molds, ingot, Cracking of.....	387
Molybdenum	
in gray iron castings.....	116
in malleable iron.....	120
in nodular iron.....	119
Vanadium steel, chromium.....	591
effect of aluminum deoxidation on.....	600

N

Nickel	
in gray iron castings.....	116
in malleable iron.....	121
in nodular iron.....	119
Nitrogen, effect on impact value of steel.....	64
Nodular iron.....	493
castings.....	118
shell molded.....	5
Nodular irons, Riser of.....	271
Nodules in white cast iron.....	515
Noise reduction.....	329
in the manufacture of marine propellers through the use of vibration damping.....	588
Nondestructive testing.....	149
Non-Ferrous	
castings.....	435
metals, melting.....	543
Novel aluminum engine die castings.....	489
Nucleation of graphite during decomposition of cementite.....	515

O

Oil for melting malleable iron.....	242
Oxidation losses of malleable iron.....	75
Oxygen	
determinations of steel castings.....	592
free copper castings, Gas porosity in.....	611

P

Pad washing with carbon arc process.....	430
Parting compounds.....	325
Pattern	
finish.....	287
making, New developments for industry.....	608
material, Epoxy resin as.....	504
Patterns.....	325
for shell molding light alloys.....	464

- Pearlitic
 gray cast iron, Grain size in..... 41
 malleable irons, comparison of liquid—and
 air-quenched 91
 People — The other side of the air pollution problem... 311
 Permanent mold castings 2
 aluminum alloy 255
 pH of molding sand 485
 Phenolformaldehyde resin as binder for shell molds..... 625
 Phenolic resins as pattern material..... 504, 668
 Phosphorus
 additions to copper 619
 effect on steel 309
 in malleable iron 120
 in pig iron 112
 Photomicrograph of gray cast iron..... 45, 709-718
 Photomicrography 688-721
 Pig iron, Use in iron foundries 104
 Pinholing in steel castings 591
 Pitch, as an additive to sand..... 22, 286
 Plastic patterns 504, 668
 Plate casting 661
 Polishing samples for metallographic inspection..... 689
 Polyester plastics for patternmaking 668
 Polytetrafluorethylene in molten steel..... 64
 Pore formation in solidifying metals, Mechanism for... 658
 Porosity
 in copper castings 611
 of die castings 237
 Pouring
 ladles, Temperature drop in 565
 temperature, effect on shell molded castings..... 626
 effect on shrink depth..... 271
 Practical foundry application of statistical quality control 232
 Precision casting 315
 with CO₂ process sand..... 336
 Pressure tightness in 85-5-5-5 bronze castings..... 339
 Price of pig iron..... 110
 Principles of core blowing..... 577
 Propeller manufacture, Noise reduction in..... 588
 Properties of refractories affect air furnace bottom service 432
 Public relations 311
- Q**
- Quality
 of castings 459
 control 461
 statistical 232
 Quantitative evaluation of the susceptibility of various alloys to shrinkage defects..... 665
- R**
- Radiographic technique 150
 Radiography, application in manufacture of bronze castings 149
 Recent development of the coreless line frequency induction melting furnace in European foundries... 543
 Refractories
 basic cupola 493
 effect on air furnace bottom service..... 432
 Refractory materials for coreless furnaces..... 548
 Resin-coated foundry sands 247
 Resin, Epoxy, as pattern material..... 504
 Resins for patternmaking 668
 Rice hulls as riser insulation 271
 Riser, effect on shell-mold castings..... 626
 Riser, effect on nodular irons..... 271
- S**
- Sale of castings..... 10
 Sand
 CO₂ process, High pressure molding with..... 336
 castings, Surface finish of..... 284, 671
 control 234, 288
 core and shell mold..... 125
 distribution, influence on metal penetration..... 82
 effect on surface quality of steel castings..... 632
 fineness, effect on casting finish..... 671
- Sand (Cont.)
 foundry, Statistical techniques for classifying..... 679
 grain size and surface finish..... 284
 handling 134
 jolt test for 415
 mixtures,
 core 344
 molded, transverse test..... 353
 molding 398
 for CO₂ process 99
 problems, anionic or cationic agents..... 453
 resin coated 247
 steel molding 482
 testing 408
 sieves, Glass spheres for calibrating..... 443
 Schuermann furnace 534
 Sea coal as an additive..... 286
 Selenium
 in malleable iron 121
 in nodular iron 119
 Service life of iron castings can be affected by their thermal conductivity 223
 Shell
 mold
 sands, tensile and transverse strength testing of..... 125
 tensile bar for light alloys..... 463
 molding
 inorganic binders for 625
 machine 422
 of nodular iron..... 5
 sand 247
 vs. ceramic mold process..... 442
 molds, Procedure for making..... 625
 Shooting of cores 577
 Shot peened cast iron..... 517
 Shrink depth of nodular irons..... 271
 Shrinkage defects in alloys..... 665
 Sieves, sand testing, Calibrating of..... 443
 Silica
 as an oxygen source in copper castings..... 613
 base core wash 82
 flour, sand mixtures..... 353
 Silicon
 in aluminum die castings..... 236
 effect on tensile properties of aluminum alloy..... 256
 influence on tensile properties of malleable base spheroidal iron 207
 in malleable iron 120
 magnesium alloys, aluminum-, Tensile Properties of..... 470
 in pig iron 112
 Silicosis, Aluminum therapy for..... 509
 Silvery pig iron 109
 Slag,
 Basic 497
 formation on metal surface..... 560
 Slope casting 376
 Smokes and fumes from cupolas..... 525
 Snotters 322
 Sodium
 carbonate in sand 486
 modification, effect on tensile strength of aluminum-silicon-magnesium alloys 470
 silicate binder for CO₂..... 336
 Solidification
 characteristics of nodular iron castings..... 279
 of metals 640
 in a flowing stream..... 636
 pore formation in 658
 range, determining effect on fluidity..... 653
 Some aspects of dust suppression in foundries..... 136
 Some considerations on the tensile and transverse strength testing of shell mold and core sands..... 125
 Some factors affecting fluidity of metals..... 640
 Some observations on the transverse test at elevated temperatures for molded sand mixtures..... 353
 Specifications for pig iron..... 106

Spheroidal			
graphite cast iron, coreless line frequency furnace melting of	548		
Iron, malleable base	197		
Statistical			
quality control, Practical foundry application of	232		
techniques for classifying foundry sands	679		
Steel			
castings			
by CO ₂ process	98		
ceramic-mold process for	439		
high alloy	5		
hot-tearing characteristics	293		
low-carbon, shell molding of	625		
metallography of	709		
Cr-Mo-V	591		
effect of aluminum deoxidation on	600		
coreless line frequency furnace for melting	549		
Steel			
cost	499		
foundry sands	453		
gas flushing of	62		
heat loss in pouring ladles	565		
making practice	293		
molding sand	482		
Stickiness in core sand mixtures	344		
Stove, Oldest known cast iron	577		
Strength			
of carbon dioxide hardened sand	19		
of gray iron	214		
Stress-strain relationship for gray iron	214		
Sub-surface blowholes in gray irons and their association with manganese sulphide segregation	551		
Sulphur			
content, effect on Cr-Mo-V steel	601		
content of iron from hot-blast cupola	175		
determinations of steel castings	592		
influence on graphite structure	206		
in malleable iron	120		
in pig iron	112		
Surface			
active agents	455		
drying of steel molding sands	454		
finish of gray iron castings, Factors affecting	671		
Survey of the CO ₂ process	98		
T			
Tellurium			
in gray iron castings	115		
in malleable iron	121		
in nodular iron	119		
Temperature			
for comfort of personnel	447		
drop in pouring ladles	565		
influence on mechanical strength of coke	217		
of molten metal vs. casting finish	286		
at pouring, of gray cast iron	46		
Tensile			
bar shell mold for light alloys	463		
Properties of aluminum alloy	256, 262		
Properties of aluminum-silicon-magnesium alloys and the effects of sodium modification	470		
Properties of magnesium-aluminum-zinc alloys	378		
Properties of steel castings	592		
strength of magnesium sand casting alloy	368		
of malleable iron	77		
testing of shell mold and core sands	125		
Test castings of magnesium-aluminum-zinc alloys	376		
Testing of steel castings	294		
Thermal			
conductivity	100		
of iron castings	223		
properties of carbon dioxide hardened sand	22		
Thorium,			
effect on tensile strength of magnesium alloys	371		
zinc-zirconium alloys, magnesium-, Metallography of	706		
Tin			
alloys, lead — Fluidity of	653		
in gray iron castings	116		
in malleable iron	121		
in nodular iron	119		
Titanium			
copper-alloy, age-hardening characteristics	313		
Deoxidation, effect on mechanical properties and microstructure of cast Cr-Mo-V steel	591		
determinations of steel castings	592		
in gray iron castings	116		
in malleable iron	121		
in nodular iron	118		
Tolerance, Casting	318		
Torsion studies of white cast iron	521		
Transient heat flow	100		
Transverse strength testing of shell mold and core sands	125		
Transverse test at elevated temperatures for molded sand mixtures	353		
Tungsten			
in gray iron castings	116		
in malleable iron	121		
U			
Use of epoxy resin as pattern material	504		
Use of glass spheres for calibrating sand testing sieves	443		
Use of Pig iron in iron foundries	104		
V			
Vanadium			
in gray iron castings	116		
in malleable iron	121		
steel, chromium-molybdenum	591		
effect of aluminum deoxidation on	600		
Ventilation			
in foundries	138		
in industrial plants	447		
Vertical-gating principles, Modifications in	54		
Vibration damping	588		
W			
Water			
cooled hot-blast cupolas	182		
as an oxygen source in copper castings	614		
Weldments	3		
Wood flour as an additive	287		
X			
X-ray inspection of bronze castings	149		
Y			
You can reduce noise in your foundry	329		
Z			
Zinc			
alloys, magnesium-aluminum-, Metallography of	701		
in aluminum die castings	236		
effect on magnesium alloy	364		
in gray iron castings	116		
magnesium-aluminum-alloys, Test castings of	376		
in malleable iron	121		
in nodular iron	119		
zirconium alloy, magnesium-thorium, Metallography of	706		
Zirconium			
alloy, magnesium-thorium-zinc, Metallography of	706		
in gray iron castings	116		
in malleable iron	121		

